

# *Past Experiences and Lessons Learned Under the Rongelap Resettlement Program*



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**S4.1.5 Affected People's  
Symposium**

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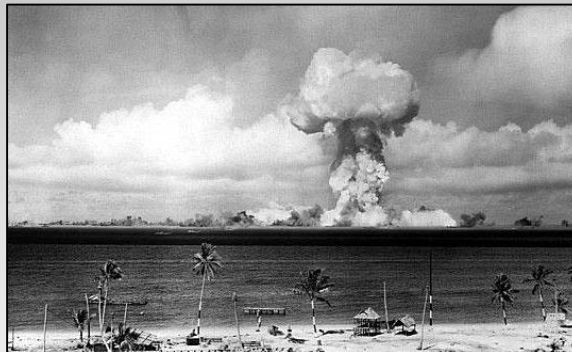


# Overview of Presentation

- ❑ The U.S. nuclear test program in the Marshall Islands – a pictorial review
- ❑ Revising the road map – based on lessons learned
- ❑ Supporting the decision to resettle Rongelap Atoll

Operation  
Crossroads

Bikini Atoll



U.S. Navy photo, courtesy  
National Archives Collection

ABLE Test, airdrop,  
30 June 1946  
Yield = 0.021 MT (UNSCEAR, 2000)



U.S. Navy photo, courtesy National  
Archives Collection

Baker Test, underwater (~30 m)  
24 July 1946  
Yield = 0.021 MT (UNSCEAR, 2000)

# Operation Castle

Bikini Atoll

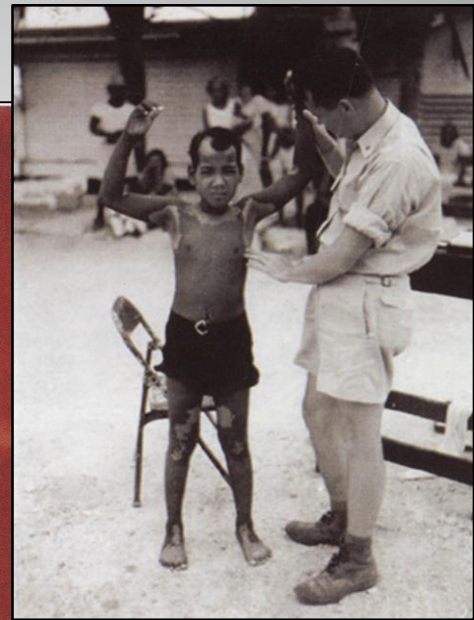
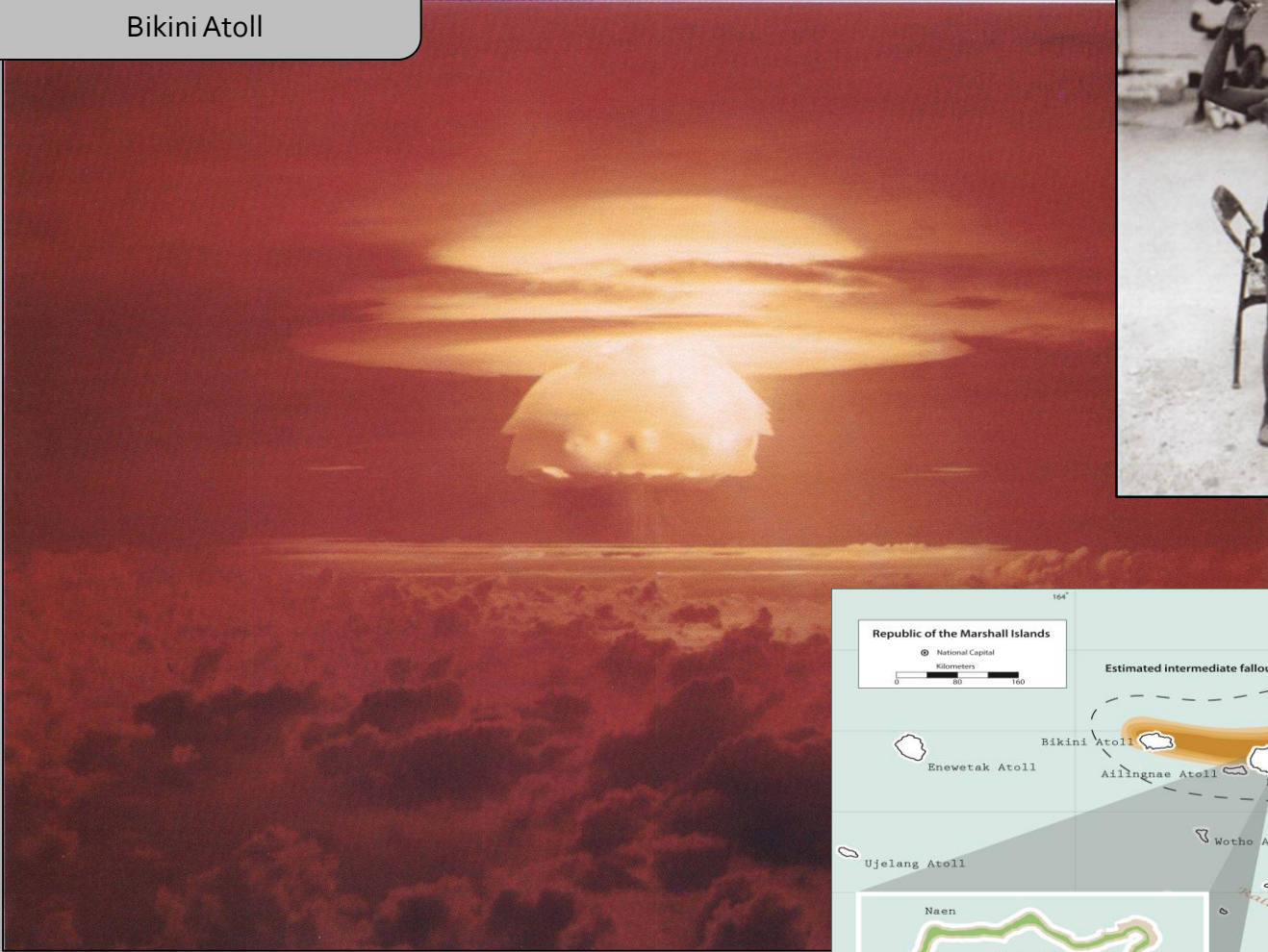
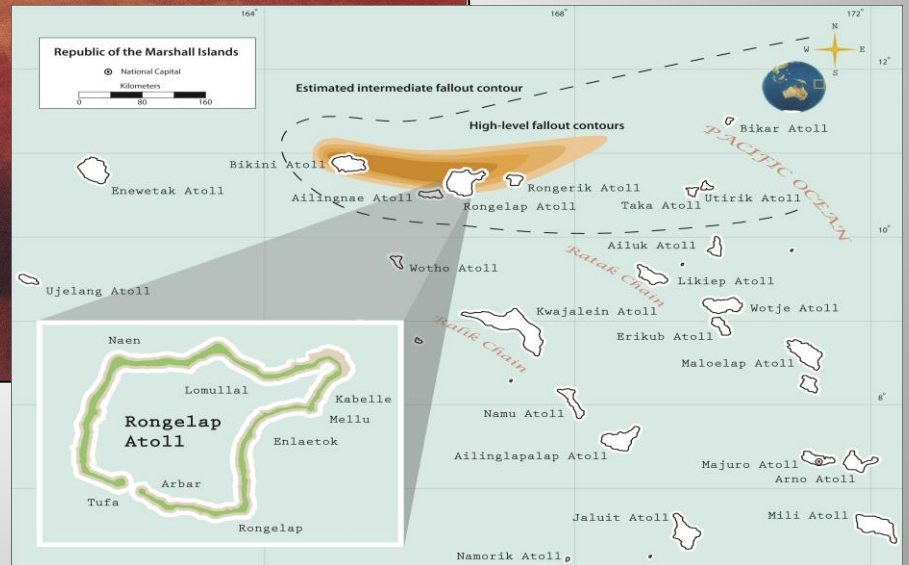


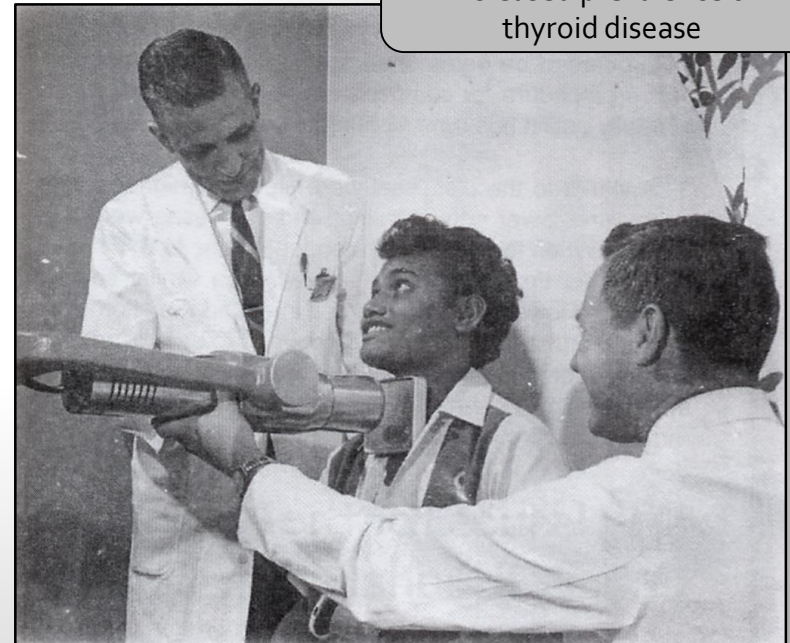
Photo courtesy of the Atomic Energy Commission

**BRAVO Test, 1 March 1954**  
Yield = 15 MT (UNSCEAR, 2000)



# Consequences of the Bravo test

- **Bravo severely damaged relations between the U.S. and the people of the Marshall Islands, and led to protests and wide-spread condemnation of atmospheric nuclear testing around the globe**
- **Bravo also contributed to the deep seated belief that the U.S. used Marshallese as nuclear guinea pigs**



Main clinical observation –  
increased prevalence of  
thyroid disease

(Photo courtesy of the Atomic  
Energy Commission)

# Impacts of Past Events

## *The Bikini Saga:*

- **August 1968, Bikini declared safe**
- **1968-72, new housing and re-vegetation of land with coconuts and other tree food crops**
- **October 1972, several families move back to Bikini**
- **June 1978, 139 people living at Bikini were found to have exceeded maximal permissible body burdens of  $^{137}\text{Cs}$  - U.S. authorities call for the people to be evacuated**

**(more social disruption adding to the level of public radiation hysteria and distrust of U.S. authorities)**

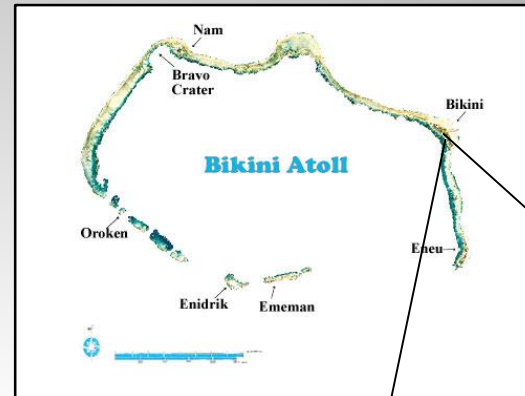


Photo: Courtesy of U.S. Navy

# Impacts of Past Events

## *The Rongelap Saga:*

- 1978, the U.S. DOE conducts what was known as the Northern Marshall Islands Radiological Survey (NMIRS)
- 1982, report issued

“The Meaning of Radiation for those Atolls in the Northern Part of the Marshall Islands that were Surveyed in 1978” with a Marshallese translation

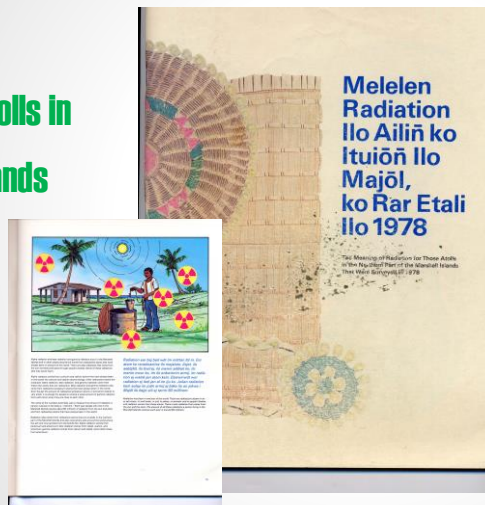


Photo credit: All rights reserved, Greenpeace/ Fernando Pereira

- May 1985 – following an international plea for evacuation assistance, Greenpeace aid the people of Rongelap to enter into self-imposed exile

# Understanding a culture ruled by societal fear of radiation and distrust of U.S. authorities

- **Impacts of all these events extended well beyond the hard facts of radiation - holistic and cultural damages associated with community relocation, restructuring and forced change**
- **The present situation is complicated by complexities associated with many other Marshallese issues and concerns, and on-going claims for nuclear compensation**





Photo Credit: Giff Johnson, Marshall Islands Journal

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Beney goes from student to instructor at USP: P17

**The Marshall Islands JOURNAL** \$1 on Majuro

Friday, March 9, 2012 • Volume 43, Number 10

Martha Campbell: 'US has provided \$600 million for compensation and aid to nuclear affected islands.'

Philip Muller: 'RMI government insulted by US plan to test Minuteman on Bravo Day.'

**Government puts the focus back on nuclear issues**

**Loeak's bomb squad**

GIFF JOHNSON  
Coordinated and forceful Marshall Islands testimony on nuclear testing at last Thursday's Nuclear Survivors Remembrance Day put the United States on notice that unresolved nuclear test problems are a top priority of President Christopher Loeak's new government. Though hastily organized, the March 1 ceremony at the ICC showed new resolve by the RMI government to revive the dormant "changed circumstances" position for additional nuclear test compensation. It also featured the most outspoken comments from Marshallese heard in many years, spicing the ceremony with unannually blunt criticism of the US government's handling of its nuclear legacy.

Baker blows at Bikini. P12

Charles Donnicks: 'US covered up radiation problems at non-four atoll islands.'

Hiroshi Yamamura: 'Time for US Congress to make good on Nuclear Claims Tribunal awards.'

Marshall martial arts in the Marshalls

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Marshall Islands Journal, 10 March, 2012

# Revising the road map

## Background

- **Through the Rongelap Resettlement Act, the U.S. Congress approved and continued a 1996 resettlement agreement between the U.S. and Rongelap Atoll Local Rongelap (RALGov)**
- **In 1999, the DOE entered into a bilateral community agreement with the RALGov with shared levels of responsibilities and assigned tasks for supporting Rongelap resettlement, including the establishment of an occupational monitoring program for workers based on whole body counting and bioassay**
- **This was the first time that the DOE has partnered with a local atoll government to deliver services in direct support of a resettlement program in the Marshall Islands**



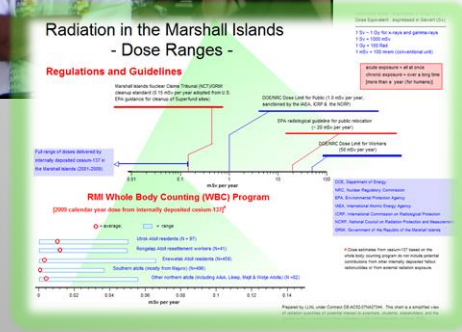
## Revising the road map, continued

- **These efforts expanded on recommendations put forward by an independent assessment conducted by National Research Council on Rongelap resettlement (NRC 1994)**
- **Since this time, the DOE and their supporting contractors have been very pro-active in terms of responding to community needs reaching outside of agreed support criteria stipulated in formalized MOU agreements**
- **A strong emphasis is placed on developing a self-help regiment by providing training, education and employment for Marshallese technicians to monitor workers and the return of the population, and in attempting to reduce uncertainty in the long-term sustainability of the resettlement program by conducting scientific studies to assess future change in exposure conditions**

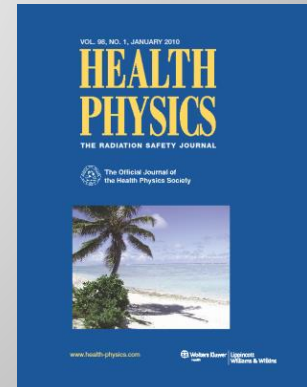
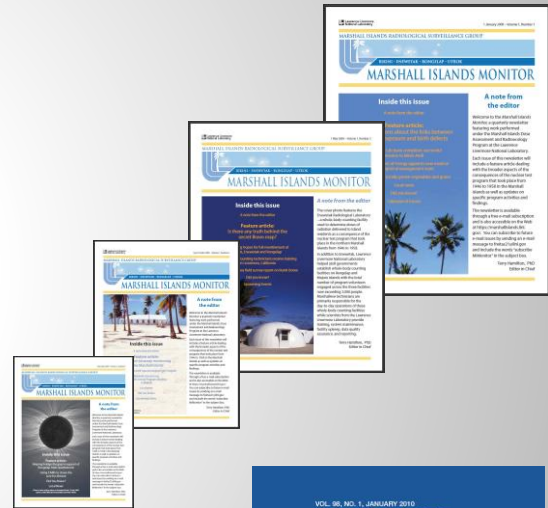


# Revising the road map, continued

- By far, our greatest limitation and challenge is in the area of communication - expressing the science of radiation in simple terms, and building understanding and public trust



(<https://marshallislands.lni.gov>)



# Supporting the decision to resettle

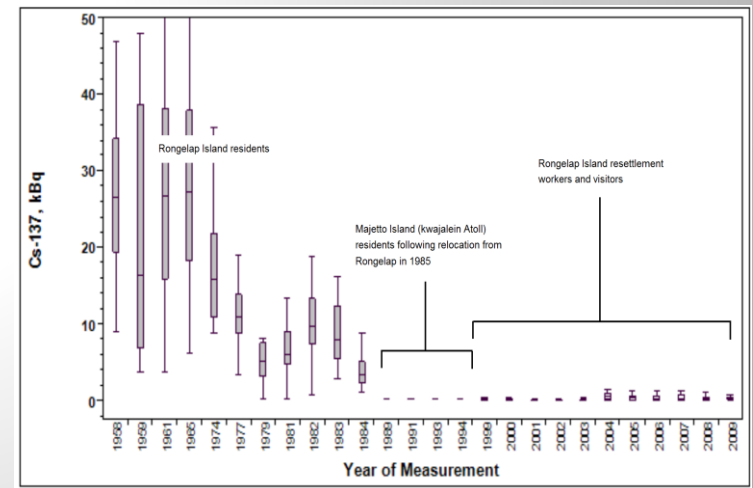
## (i) Whole body counting program (past and present)

- In cooperation with local government contractors and the LLNL, the DOE Office of Health and Safety has established a permanent whole body counting facility on Rongelap Island



# TAKE HOME MESSAGE

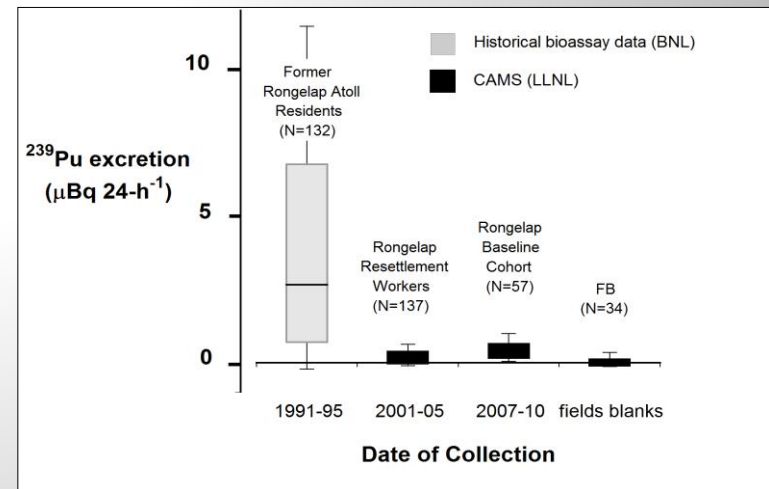
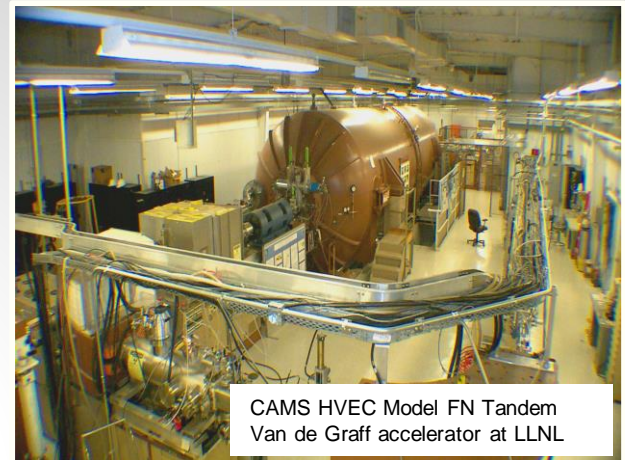
- Radiological conditions on Rongelap have significantly improved since 1985
- The average dose contribution from internally deposited  $^{137}\text{Cs}$  delivered to resettlement workers living on Rongelap Island over the past 10 years has ranged from  $<0.01$  to  $0.024$  mSv per year (provides a measure of what the resettled community might expect)
- These results compare with dose acceptance criteria for resettlement developed under an original 1992 MOU agreement of less than  $1.0$  mSv per year for maximally exposed individuals, and the GRMI cleanup dose criterion of  $0.15$  mSv per year (adopted from recommendations of the U.S. EPA for radiological cleanup of superfund sites in the United States)



# Supporting the decision to resettle

## (ii) Plutonium bioassay testing

- Determined the urinary excretion of plutonium from resettlement workers and former resettlements (based on AMS technologies)**
- Results of bioassay program show that neither the resettlement workers nor former residents have acquired measureable quantities of plutonium in their bodies in excess of that expected from exposure to general worldwide fallout contamination**
- Levels of Pu uptake on Rongelap are low and have always been low**



(median average value ~0.1 μBq <sup>239</sup>Pu per 24-h void)

# Supporting the decision to resettle

## (iii) Results of Environmental Research and Monitoring Program

- **There is an environmental loss of  $^{137}\text{Cs}$  from coral soils to ground water that results in a 3 to 4 fold more rapid depletion of  $^{137}\text{Cs}$  from the atoll ecosystem than expected by radioactive decay alone, i.e., radiological conditions are improving at an accelerated rate making early resettlement of islands and atolls much more plausible, and less costly to implement**

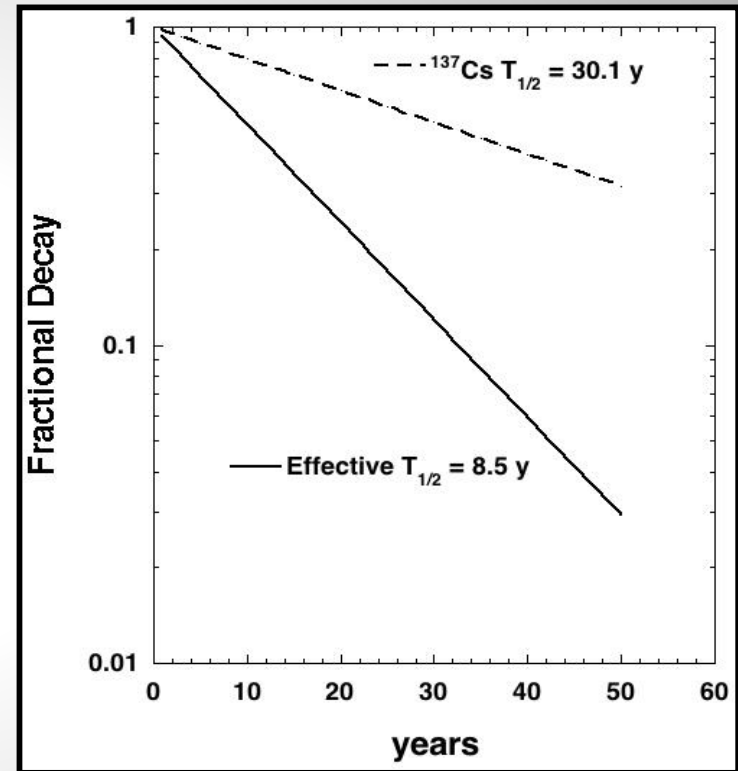


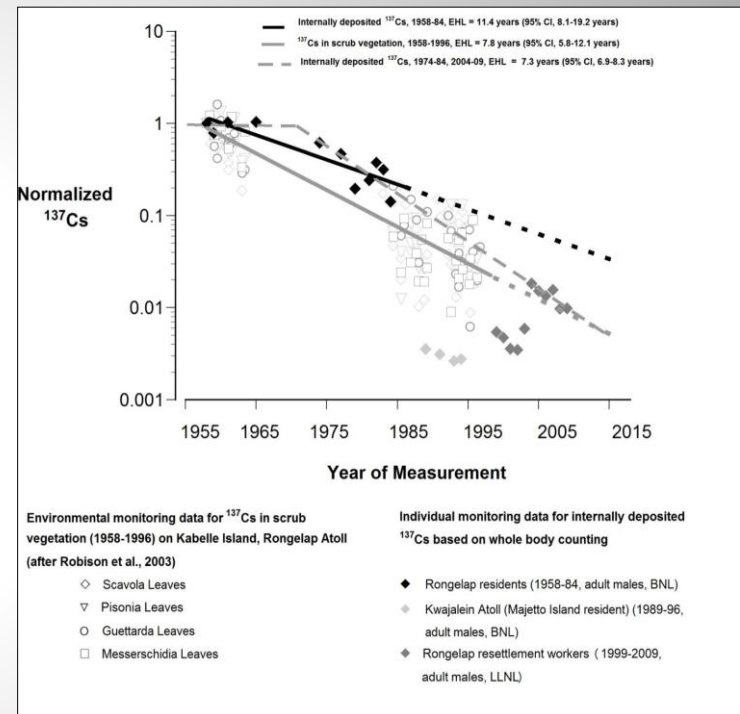
Figure showing the fractional loss rates of  $^{137}\text{Cs}$  based on its effective half-life (8.5 years) versus radioactive half-life (30 years).



# TAKE HOME MESSAGE

- **Can now claim a better understanding of the long-term behavior of  $^{137}\text{Cs}$  in the environment**
- **Behavior of  $^{137}\text{Cs}$  in the environment and levels of internally deposited  $^{137}\text{Cs}$  in people living on Rongelap Island appear to be highly correlated**
- **Gives us added confidence that conditions on Rongelap will comply with safety criterion established for resettlement**

**(OK to return to their former lifestyle)**



# Supporting the decision to resettle

## (iv) Effectiveness of Implemented and Proposed Cleanup Measures

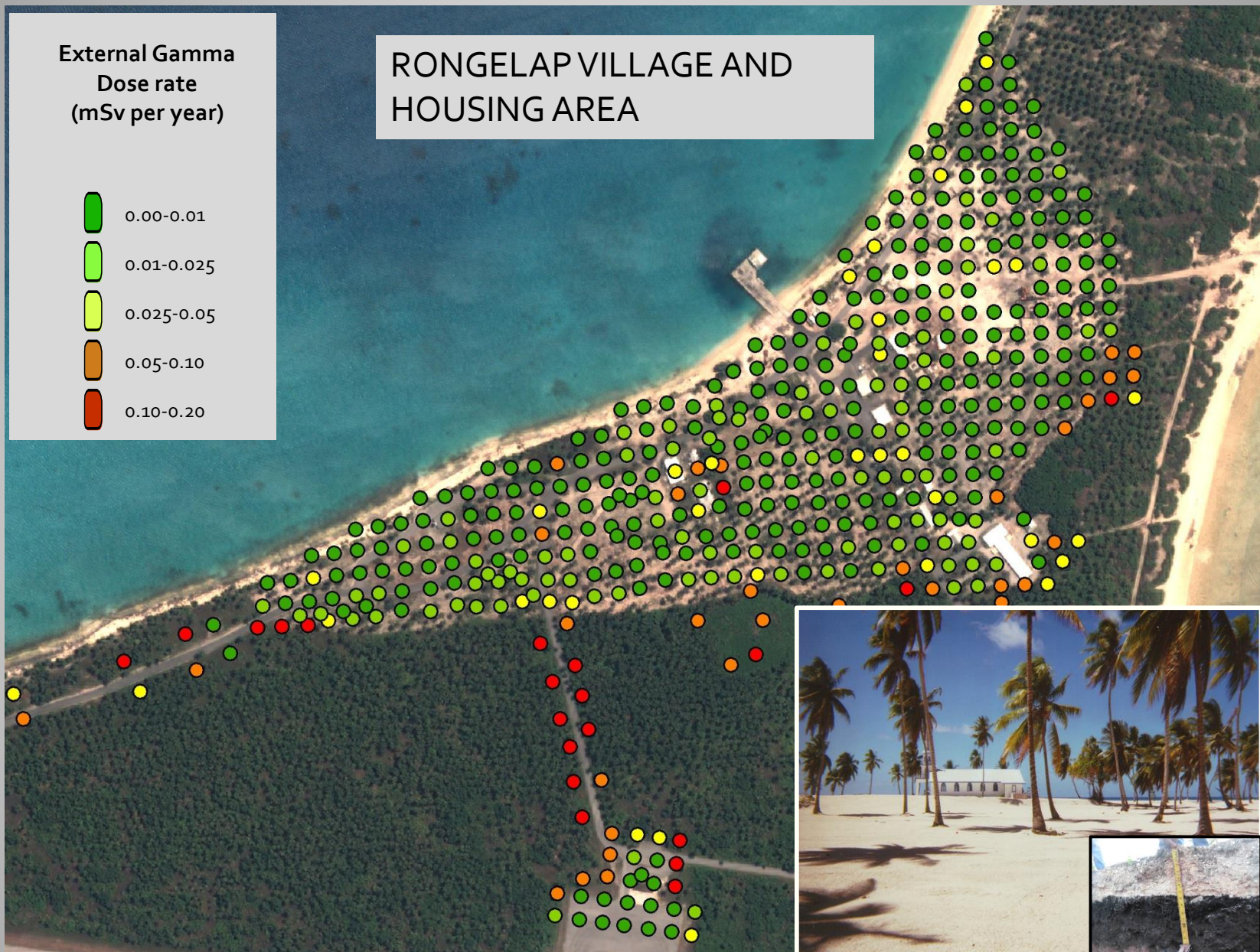
- **Under the Rongelap Resettlement Plan, RALGov adopted a series of recommendations from the Lawrence Livermore National Laboratory for cleanup and remediation of Rongelap Island**
- **This work has centered around the use of the “Combined Option” remedial action program**
- **The *Combined Option* calls for treatment of food crops and fruit trees with potassium to reduce the uptake of  $^{137}\text{Cs}$  in locally grown foods, and removal of the top 15 cm of soil around houses and community buildings and addition of clean, crushed coral fill to reduce external radiation exposure in areas where people spend most of their time**



External Gamma  
Dose rate  
(mSv per year)



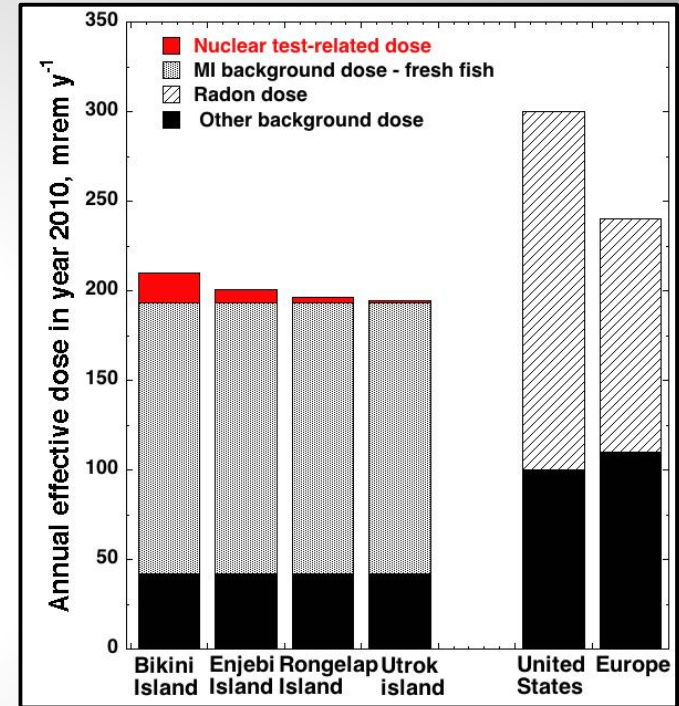
# RONGELAP VILLAGE AND HOUSING AREA



# Supporting the decision to resettle

## (v) Comparable risks and added benefits

- **Dose estimates show that the average background dose plus the predicted anthropogenic nuclear test-related dose on Rongelap Island will be far less (about 1.93 mSv per year) than the average background dose in the U.S. and Europe**
- **Resettlement could offer the people of Rongelap real tangible benefits to improve community health and lifestyle simply through access to spacious housing and clean drinking water**



Predictive dose assessments are based on the effective half-life of <sup>137</sup>Cs, full implementation recommended remedial measures, and a diet consisting of both imported and local foods

# Summary Points and Recommendations

- **Value high quality and defensible science**
- **Get the science right because it is so difficult to change perception once information is in the public record**
- **Impacted communities in the Marshall Islands want to be assured that their health will be protected, and desire certainty and finality in remediation decisions**
- **Continual interactions with stakeholders is of paramount importance, take a proactive posture rather than being defensive**
- **Provide formal mechanisms for stakeholders to be seen and heard (e.g., MOU agreements, meetings, workshops, community outreach programs)**
- **Place a strong emphasis towards developing a self-help regiment and in technology transfer**
- **Use transparent reporting platforms with open access to data and information (<https://marshallislands.llnl.gov/>)**



# Summary Points and Recommendations

- **Risk communication has emerged as a key issue in providing necessary assurances in support of resettlement programs in Marshall Islands**
  
- **Concerns as related to the Marshall Islands experience**
  - **The language of radiation and lack of clarity over which radiation protection standards apply**
  - **Years of social amplification of health impacts of radiation exposure**
  - **Deep rooted distrust of U.S. authorities based on past management decisions at Bikini (and Rongelap)**
  - **Conflicting advice from local scientists and environmental groups**
  - **Public perception that uncertainty and unlikely outcomes from radiation exposure are proof of lingering real long-term dangers**

# Concluding Remarks

- **In general, data and information developed under the Rongelap resettlement program provide a strong scientific foundation for supporting a decision to resettle**
- **A final decision to resettle rests in the hands of RALG and the people of Rongelap**



**Kommol Tata  
(Thank you)**